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2009



MAR 18 2010

December 2009

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Biosecurity on U.S. Beef Cow-calf Operations

The U.S. Department of Agriculture's National Animal Health Monitoring System (NAHMS) conducted the Beef 2007–08 study, which focused on beef cow-calf health and management practices in 24 States. These States represented 79.6 percent of U.S. operations with beef cows and 87.8 percent of U.S. beef cows.

An objective of the Beef 2007–08 study was to describe current biosecurity practices on cow-calf operations. Biosecurity involves the use of certain management practices designed to prevent the introduction of disease to a premises. Examples of these practices include: limitations on new animal sources, quarantine and testing of new animal additions, rodent control and control of other animals that may serve as vectors for infectious agents, control of fence-line contact with outside cattle and other animals, and monitoring and controlling human and vehicle traffic on the operation. Usually, a comprehensive biosecurity plan also includes measures to increase the animals' resistance to disease (e.g., vaccination).

Herd additions

Herd additions can be a source of disease introduction. Producers were asked about the addition of cattle during the previous 12 months and during the previous 3 years. The percentage of operations that added any cattle during the previous 12 months increased as herd size increased, from 27.6 percent of operations with 1 to 49 beef cows to 69.9 percent of operations with 200 or more beef cows. During the previous 3 years, 67.8 percent of operations added cattle (table 1).

Table 1. Percentage of Operations that Brought New Cattle onto the Operation During the Following Time Periods, by Herd Size

	Percent Operations				
	Herd Size (Number of Beef Cows)				
Cattle added during...	1-49	50-99	100-199	200 or More	All Operations
Previous 12 months	27.6	43.0	58.0	69.9	34.5
Previous 3 years	58.6	88.3	88.1	89.2	67.8

The level of risk for introducing a disease to an operation varies depending on the source and type of new cattle. For instance, the risk of adding an animal from a herd of known health status (e.g., negative for Johne's disease) would be lower than the risk of adding an animal obtained from a herd of unknown status. The most common sources for herd additions on operations that brought on new cattle were another beef operation (70.3 percent of operations) and sale barn/auction (34.8 percent of operations).

The most common classes of cattle brought on during the previous 12 months were weaned beef bulls (19.5 percent of operations) and pregnant beef cows (9.2 percent of operations).

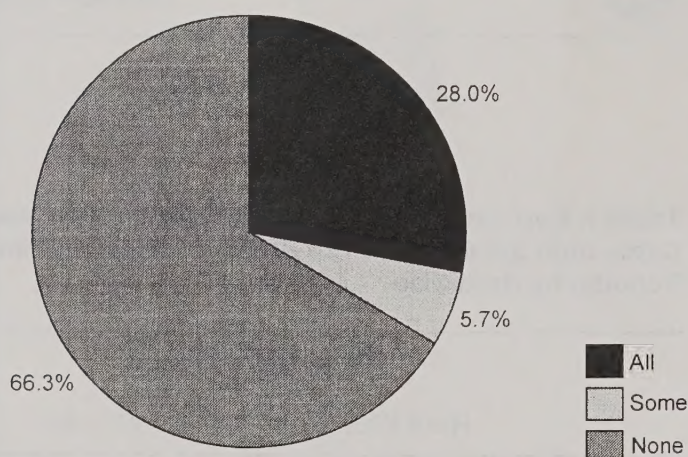
Quarantine of new arrivals

Isolation of new animals is one way to decrease the risk of introducing new disease agents into the herd. New additions can be monitored for disease symptoms while in isolation; the isolation period should be long enough to allow recently infected animals to begin to show signs of disease. Almost two-thirds of operations that added cattle during the previous 12 months did not quarantine any of the new cattle (figure 1).

* States

Alabama, Arkansas, California, Colorado, Florida, Georgia, Idaho, Iowa, Kansas, Kentucky, Louisiana, Mississippi, Missouri, Montana, Nebraska, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, Tennessee, Texas, Virginia, and Wyoming.

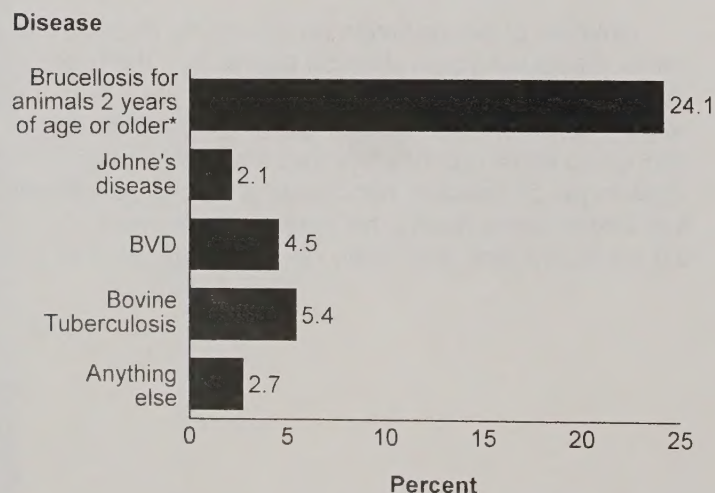
Figure 1. For Operations that Brought New Cattle onto the Operation During the Previous 12 Months, Percentage of Operations that Quarantined or Separated All, Some, or None of the New Additions



Testing new arrivals

Another strategy to reduce the chance of introducing infectious pathogens is to require testing of newly acquired cattle for diseases before bringing them onto the operation. Some disease agents, such as bovine viral diarrhea (BVD) virus and the bacterium that causes Johne's disease, can be carried by cattle with no outward signs. Almost one of four operations that brought cattle 2 years of age or older onto the operation during the previous 3 years (24.1 percent) required that these animals be tested for brucellosis. About 1 of 20 operations that brought cattle onto the operation during the previous 3 years required testing for BVD (4.5 percent) or bovine tuberculosis (5.4 percent), and only 1 of 50 operations (2.1 percent) required testing for Johne's disease (figure 2).

Figure 2. For Operations that Added Cattle During the Previous 3 Years, Percentage of Operations that Normally Required Tests for the Following Diseases Before Bringing Cattle onto the Operation

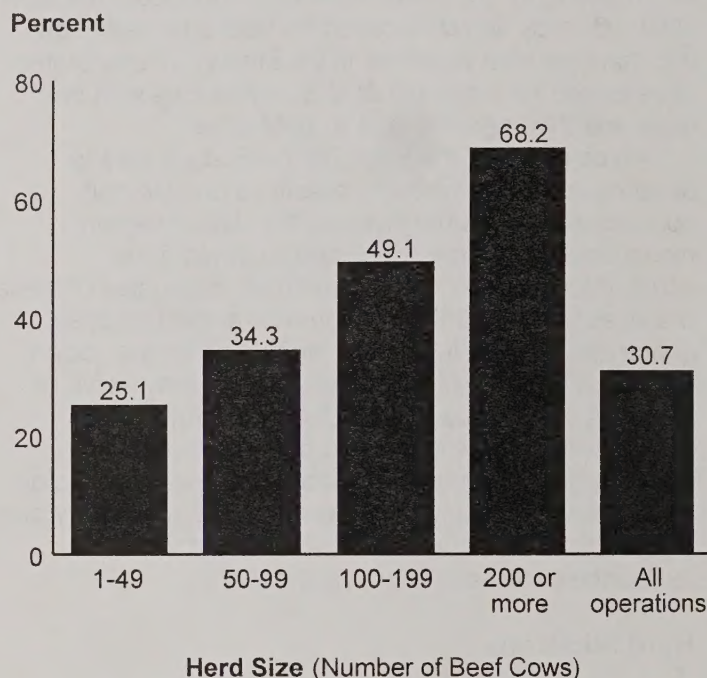


*Excludes operations that brought on only cattle less than 2 years of age.

Bulls used for breeding

The percentages of operations that purchased, leased, or borrowed bulls for the last breeding season increased as herd size increased, ranging from 25.1 percent of operations with 1 to 49 beef cows to 68.2 percent of operations with 200 or more beef cows (figure 3).

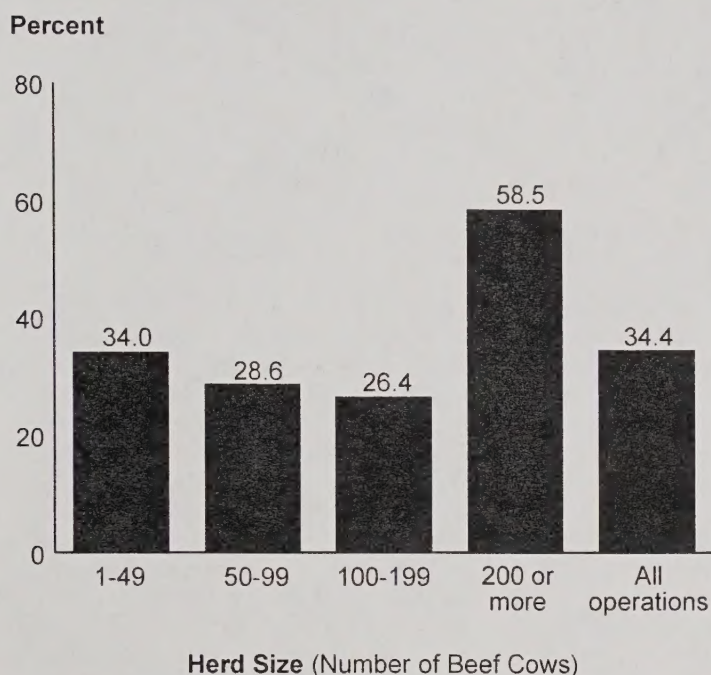
Figure 3. Percentage of Operations that Purchased, Leased, or Borrowed Bulls in Preparation for the Last Breeding Season, by Herd Size



The addition of bulls for breeding can introduce venereally transmitted diseases such as *Tritrichomonas fetus*. *Tritrichomonas* can cause economic losses due to infertility and abortions. Testing for *Tritrichomonas* is recommended for all new bulls over 18 months of age or no longer considered virgin. Bulls should be tested three times at weekly intervals prior to being introduced to the herd, and positive bulls should be sent to slaughter. Just over one of three operations (34.4 percent) that purchased, leased, or borrowed bulls over 18 months of age or no longer considered virgin had all these bulls cultured for *Tritrichomonas*. A higher percentage of operations with 200 or more cows tested all these bulls than operations with fewer than 200 cows (figure 4). For comparison, in 1992 only 4.4 percent of operations that introduced bulls over 18 months of age or no longer considered virgin had all these bulls tested for *Tritrichomonas*.¹

¹Cow Health and Productivity Audit 1992/93 Part 3, Population: spring calving operations with 5 or more cows in 18 States.

Figure 4. For Operations that Introduced Bulls Older than 18 Months or No Longer Considered Virgin, Percentage of Operations that Cultured All These Bulls for *Tritrichomonas fetus*, by Herd Size



Cattle that leave the operation and then return

Animals that leave the operation to attend an event and return represent another avenue for introducing disease agents. Only 5.4 percent of operations had any cattle that left the operation to go to a show, fair, rodeo, or other event and then return during the previous 12 months (table 2). Of operations in which any cattle left the operation, had contact with other cattle, and then returned during the previous 12 months, over one-half (53.6 percent) routinely isolated cattle when they returned.

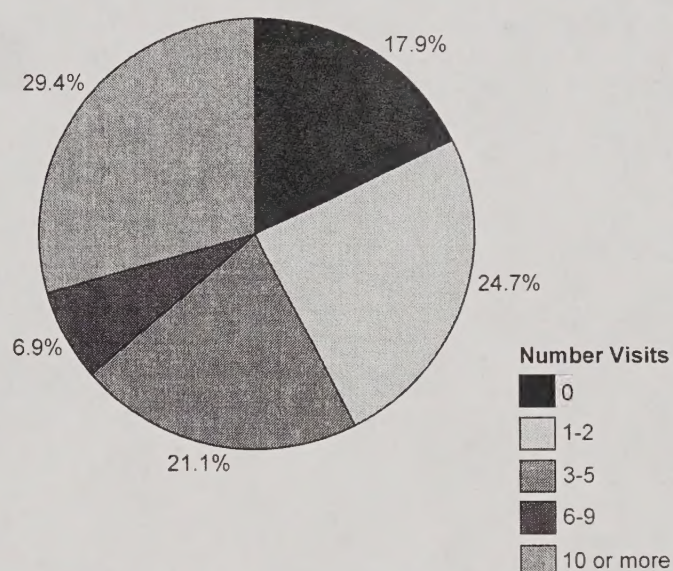
Table 2. Percentage of Operations in which Any Cattle Left the Operation to Attend a Show, Fair, Rodeo, or Other Event and Returned During the Previous 12 Months, by Herd Size

Percent Operations				
Herd Size (Number of Beef Cows)				
1-49	50-99	100-199	200 or More	All Operations
4.3	6.2	9.5	12.0	5.4

Visits to the operation

Visitors can carry disease agents from one operation to another. Producers were asked about the number of visits to the operation during an average month, including visits by employees, veterinarians, neighbors, nutritionists, commercial haulers, etc. Overall, 29.4 percent of operations had 10 or more visits in a month (fig. 5). Operations with 200 or more cows were more likely to have 10 or more visits a month than operations with fewer than 200 cows. Over one-half of operations with 200 or more cows (51.4 percent) had 10 or more visits in a month.

Figure 5. Percentage of Operations by Number of Visits to the Operation During an Average Month, Including Visits by Employees, Veterinarians, Neighbors, Nutritionists, Commercial Haulers, etc.



Contact with other animals

Some diseases can be transmitted to cattle from other animal species. For example, deer can transmit bovine tuberculosis to cattle. Also, foot-and-mouth disease can be passed among cattle, sheep, pigs, and a number of other species. Awareness of contact between cattle and other animal species can lead to a more timely response to a disease outbreak. During the previous 12 months, wild cervids (e.g., elk, deer) had fence-line contact or commingled with beef cattle on 72.6 percent of operations. Other species that had direct contact with beef cattle included horses (44.5 percent of operations), pigs (12.1 percent of operations), goats (9.6 percent of operations), dogs (69.7 percent of operations), and cats (55.4 percent of operations). Beef cattle had direct contact with dairy cattle on 3.1 percent of operations, and had direct contact with cattle of Mexican origin on only 1.0 percent of operations.



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Rodents and insects can serve as reservoirs or can mechanically carry the agents for various cattle diseases. About 8 of 10 operations (82.0 percent) used fly control during the previous 12 months, and 65.0 percent routinely used some type of rodent control during the previous 12 months.

Summary

A number of management practices can reduce the risk of introducing disease to an operation. Each operation should develop a customized biosecurity plan based on the specific risks of the operation and on the diseases targeted for control. The biosecurity plan will likely include some combination of management practices and the judicious use of vaccines. Employee training and annual review of the biosecurity plan are important aspects of maintaining a successful plan.

Further information on biosecurity can be found in the Bovine Alliance on Management and Nutrition's "An introduction to infectious disease control on farms (biosecurity)." See reference below.

Reference

Bovine Alliance on Management and Nutrition. "An Introduction to Infectious Disease Control on Farms (Biosecurity) 2001. For copies, contact: AFIA, Rich Sellers, 1501 Wilson Blvd., Suite 1100, Arlington, VA 22209.
<http://nahms.aphis.usda.gov/dairy/bamn/BAMNBiosIntro.pdf>

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